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DOBLE TESTING OF COUPLING CAPACITORS

Doble Testing Of Coupling Capacitors

(Test procedure of TVA modified for Reclamation use)

Experience has proven that coupling capacitors will explode when they become defective. Because of the possibility of injury to personnel and poor carrier performance when coupling capacitors become defective, the testing of coupling capacitors is a necessity. This chapter is provided to serve as a guide in making coupling capacitor tests by a Doble power factor test set.

Figure 1 shows a typical coupling capacitor installation. Note that an installation generally consists of the porcelain-clad capacitor unit(s) and a base housing carrier-current and/or potential-device networks. If field test results are to be compared with nameplate or earlier field data, test procedures must be consistent. Also, knowledge of the carrier and potential-device networks is necessary in order that they be properly grounded or disconnected to eliminate any effect they might have on the measurement.

The test procedure outlined under Figure 1 is designed to produce the data required for individual units with a minimum of disconnection, while enhancing safety and reducing the effects of electrostatic interference.

Test data should be recorded on the Doble "Miscellaneous Equipment" form. The report form should include complete information regarding the capacitor manufacturer, type, rating, serial number, and nameplate data (capacitance and power factor). Experience and manufacturer recommendations indicate that power factor should be of the order of 0.25 percent (less than 0.5 percent) and capacitance should be within plus or minus 1 to 2 percent of the nameplate value.

Initial tests should include Doble tests and bridge tests of capacitance and dissipation factor. Routine tests should include bridge tests of capacitance and dissipation factor. Doble tests are not normally required on a frequent basis due to the difficulty in obtaining line outages and the low failure rate of the units. Testing them "as available," when other Doble test are being made, or whenever there is some doubt about their condition, should be adequate; however, the interval between tests should not exceed 2 years. Wherever electrical fields exist that cause interference with the Doble testing procedure, an ICD (Interference Cancellation Device) should be used.

References: 1961 Doble Client Conference Minutes, Sec. 9-201.
1968 Doble Client Conference Minutes, Sec. 9-204.

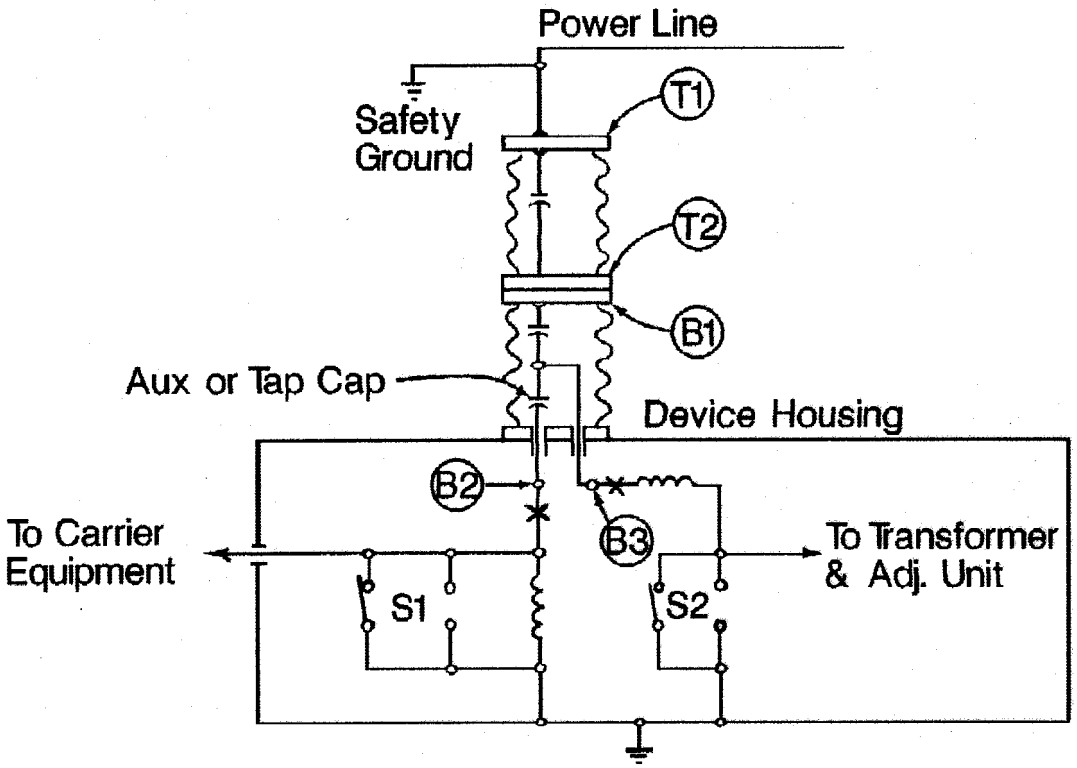

Figure 1

1. Deenergize Power Line.

2. Without disconnecting Power Line, ground T_1 using safety ground.

3. Close ground Switches S_1 and S_2 on the side of the device housing.

4. Disconnect B_2 and B_3 at Points "X" Inside the device housing. B_2 and B_3 may be found connected together, or B_3 may be floating if the capacitor is used only with carrier equipment. B_2 will be found grounded if the capacitor is used only with a potential device.

5. Test as follows:

To Measure	**Energize**	**Ground**	**Guard**	**UST**
$C(T_2\text{-}T_1)$	$B_1 = T_2$	T_1	B_3**	-
$C(B_1\text{-}B_3)$	$B_1 = T_2$	T_1	-	B_3
$C(B_1\text{-}B_2)$	$B_1 = T_2$	T_1	-	B_2
$C(B_3\text{-}B_2)$	B_3*	T_1	-	B_2

*Test voltage not to exceed rating of Tap or Auxiliary Capacitor.
**To make certain that all the current in the parallel circuit will be subtracted from the meter reading, vary the procedure slightly in that after applying the safety ground and closing the ground switches, disconnect the capacitor from the power line and test $C(T_2\text{-}T_1)$ by energizing T_2 and UST T_1.